OBSERVATIONS & RECOMMENDATIONS

After reviewing data collected from **HIGHLAND LAKE, STODDARD,** the program coordinators have made the following observations and recommendations:

Thank you for your continued hard work sampling the lake/pond this season! Your monitoring group sampled **four** times this season and has done so for many years! As you know, with multiple sampling events each season, we will be able to more accurately detect changes in water quality. Keep up the good work!

As part of the state's lake survey program, DES biologists performed a comprehensive lake survey on **HIGHLAND LAKE** this summer. Publicly-owned recreational lakes/ponds in the state are surveyed approximately every ten to fifteen years. In addition to the tests normally carried out by VLAP, biologists tested for certain indicator metals and nitrogen, created a map of the lake/pond bottom contours (referred to as a bathymetric map), and mapped the abundance and distribution of the aquatic plants along the shoreline. DES biologists will also sample the lake/pond once during the Winter of 2004-2005. Some data from this lake survey have been included in this report and has been added to the historical database for your lake/pond. If you would like a complete copy of the raw data from the lake survey, please contact the DES Limnology Center at (603) 271-3414 or (603) 271- 2658. A final report should be available in 2006 and a copy will be available at any state library. We know that your association was interested in the updated plant map. Please contact our office to receive a copy of this map.

FIGURE INTERPRETATION

- **Figure 1 and Table 1:** The graphs in Figure 1 (Appendix A) show the historical and current year chlorophyll-a concentration in the water column. Table 1 (Appendix B) lists the maximum, minimum, and mean concentration for each sampling season that the lake/pond has been monitored through the program.

  Chlorophyll-a, a pigment naturally found in plants, is an indicator of the algal abundance. Because algae are usually microscopic plants that contain chlorophyll-a, and are naturally found in lake ecosystems, the chlorophyll-a concentration measured in the water gives an estimation of the algal concentration or lake productivity. **The mean (average) summer chlorophyll-a concentration for New Hampshire's lakes and ponds is 7.02 mg/m^3.**

  NORTH DEEP SPOT
  The current year data (the top graph) show that the chlorophyll-a concentration ***remained relatively stable*** from **June** to **July**, ***increased greatly*** from **July** to **August**, and then ***decreased*** from **August** to **September**. The chlorophyll-a concentration in **June, July,** and **September** was ***much less than*** the state mean, and in **August** was ***approximately equal to*** the state mean.

  The historical data (the bottom graph) show that the 2004 chlorophyll-a mean is ***less than to*** the state mean.

  Overall, the statistical analysis of the historical data shows that the chlorophyll-a concentration has ***significantly decrease*****d** since monitoring began. Specifically, the chlorophyll-a concentration has ***decreased*** (meaning ***improved***) on average **by *approximately 6 %*** per sampling season during the sampling period **1988** to **2004**. (Note: Please refer to Appendix E for the detailed statistical analysis explanation and data print out.) We hope this trend continues!

  SOUTH DEEP SPOT
  The current year data (the top graph) show that the chlorophyll-a concentration ***increased gradually*** from **June** to **August**, and then ***decreased*** from **August** to **September**. The chlorophyll-a concentration on **each sampling event** was ***less than*** the state mean.

  The historical data (the bottom graph) show that the 2004 chlorophyll-a mean is ***less than*** the state mean.

  Overall, the statistical analysis of the historical data (the bottom graph) shows that the mean annual chlorophyll-a concentration has

not significantly changed since monitoring began**.** Specifically, the chlorophyll-a concentration has ***fluctuated*** but has ***not continually increased or decreased*** since **1994**. (Note: Please refer to Appendix E for the detailed statistical analysis explanation and data print out.)

While algae are naturally present in all lakes/ponds, an excessive or increasing amount of any type is not welcomed. In freshwater lakes/ponds, phosphorus is the nutrient that algae depend upon for growth. Algal concentrations may increase with an increase in nonpoint sources of phosphorus loading from the watershed, or in-lake sources of phosphorus loading (such as phosphorus releases from the sediments). Therefore, it is extremely important for volunteer monitors to continually educate residents about how activities within the watershed can affect phosphorus loading and lake/pond quality.

- **Figure 2 and Table 3:** The graphs in Figure 2 (Appendix A) show historical and current year data for lake/pond transparency. Table 3 (Appendix B) lists the maximum, minimum and mean transparency data for each sampling season that the lake/pond has been monitored through the program.

Volunteer monitors use the Secchi-disk, a 20 cm disk with alternating black and white quadrants, to measure water clarity (how far a person can see into the water). Transparency, a measure of water clarity, can be affected by the amount of algae and sediment from erosion, as well as the natural colors of the water. **The mean (average) summer transparency for New Hampshire's lakes and ponds is 3.7 meters.**

NORTH STATION

The current year data (the top graph) show that the in-lake transparency ***decreased gradually*** from **June** to **August**, and then ***increased*** from **August** to **September**. The transparency on the **June** and **September** sampling events was ***approximately equal to*** the state mean, while the transparency on the **July** and **August** sampling events was ***less than*** the state mean.

The historical data (the bottom graph) show that the 2004 mean transparency is ***slightly less than*** the state mean.

Overall, the statistical analysis of the historical data (the bottom graph) shows that the mean annual in-lake transparency has ***not significantly changed*** (either *increased* or *decreased*) since monitoring began. Specifically, the in-lake transparency has remained ***relatively stable, ranging between approximately 2.5 and 3.5 meters,*** which is ***slightly less than*** the state mean, since

1988. (Note: Please refer to Appendix E for the statistical analysis explanation and data print out.)

SOUTH STATION
The current year data (the top graph) show that the in-lake transparency ***remained relatively stable*** from **June** to **September**.

Overall, the statistical analysis of the historical data (the bottom graph) shows that the mean annual in-lake transparency has ***not significantly changed*** (either *increased* or *decreased*) since monitoring began. Specifically, the in-lake transparency has remained ***relatively stable, ranging between approximately 2 and 3 meters***, since **1994**. (Note: Please refer to Appendix E for the statistical analysis explanation and data print out.)

Typically, high intensity rainfall causes erosion of sediments into lakes/ponds and streams, thus decreasing clarity. Efforts should continually be made to stabilize stream banks, lake/pond shorelines, disturbed soils within the watershed, and especially dirt roads located immediately adjacent to the edge of tributaries and the lake/pond. Guides to Best Management Practices designed to reduce, and possibly even eliminate, nonpoint source pollutants, such as sediment loading, are available from DES upon request.

- **Figure 3 and Table 8:** The graphs in Figure 3 (Appendix A) show the amounts of phosphorus in the epilimnion (the upper layer) and the hypolimnion (the lower layer); the inset graphs show current year data. Table 8 (Appendix B) lists the annual maximum, minimum, and median concentration for each deep spot layer and each tributary since the lake/pond has joined the program.

  Phosphorus is the limiting nutrient for plant and algae growth in New Hampshire's freshwater lakes and ponds. Too much phosphorus in a lake/pond can lead to increases in plant and algal growth over time. The median summer total phosphorus concentration in the epilimnion (upper layer) of New Hampshire's lakes and ponds is 12 ug/L. The median summer phosphorus concentration in the hypolimnion (lower layer) is 14 ug/L.

  NORTH STATION
  The current year data for the epilimnion (the top inset graph) show that the phosphorus concentration ***decreased slightly*** from **June** to **July**, ***increased*** from **July** to **August**, and then ***remained stable*** from **August** to **September**. The phosphorus concentration on **each sampling event** was ***less than*** the state median.

The current year data for the hypolimnion (the bottom inset graph) show that the phosphorus concentration ***decreased slightly*** from **June** to **July**, ***increased*** from **July** to **August**, and then ***decreased slightly*** from **August** to **September**. The phosphorus concentration on the **June, July,** and **September** sampling events was ***less than*** the state median, and on the **August** sampling event was ***approximately equal to*** the state median.

Overall, the statistical analysis of the historical data shows that the phosphorus concentration in the epilimnion (upper layer) has ***significantly decreased*** since monitoring began. Specifically, the phosphorus concentration in the epilimnion has ***decreased*** (meaning ***improved***) on average by ***approximately 3 %*** per sampling season during the sampling period **1988** to **2004**. (Note: Please refer to Appendix E for the statistical analysis explanation and data print out.) We hope this trend continues!

Overall, the statistical analysis of the historical data shows that the phosphorus concentration in the hypolimnion (lower layer) has ***not significantly changed*** since monitoring began. Specifically, the phosphorus concentration has ***fluctuated between approximately 10 and 36 ug/L,*** but has ***not continually increased or decreased,*** since **1988**.

SOUTH STATION

The current year data for the epilimnion (the top inset graph) show that the phosphorus concentration ***increased very gradually*** from **June** to **September**. The phosphorus concentration on the **June** and **July** sampling events was ***less than*** the state median and on the **August** and **September** sampling events was ***approximately equal to*** the state median.

The historical data show that the 2004 mean epilimnetic phosphorus concentration is ***approximately equal to*** the state median.

The current year data for the hypolimnion (the bottom inset graph) show that the phosphorus concentration ***increased very slightly*** from **June** to **July**, ***decreased very slightly*** from **July** to **August**, and then ***increased*** from August to September. The phosphorus concentration on **each sampling event** was ***less than*** the state median.

Overall, the statistical analysis of the historical data shows that the phosphorus concentration in the epilimnion (upper layer) has ***not significantly changed*** since monitoring began in 1994. However, visual inspection of the historical trend line shows that the concentration may have ***slightly decreased*** (meaning *slightly improved*) since monitoring began in 1994. If the epilimnetic phosphorus concentration continues to ***slightly decrease*** each season, the decrease may soon become statistically significant. (Note: Please refer to Appendix E for the detailed statistical analysis explanation and data print out.)

Overall, visual inspection of the historical data trend line for the hypolimnion shows a ***slightly decreasing*** *(meaning slightly improving)* phosphorus trend since monitoring began in 1996. After 10 consecutive years of sample collection, we will be able to conduct a statistical analysis of the historical data to objectively determine if there has been a significant change in the annual mean hypolimnetic phosphorus concentration since monitoring began.

One of the most important approaches to reducing phosphorus loading to a waterbody is to continually educate watershed residents about its sources and how excessive amounts can adversely impact the ecology and value of lakes and ponds. Phosphorus sources within a lake or pond's watershed typically include septic systems, animal waste, lawn fertilizer, road and construction erosion, and natural wetlands.

TABLE INTERPRETATION

- **Table 2: Phytoplankton**

  Table 2 (Appendix B) lists the current and historical phytoplankton species observed in the lake/pond. Specifically, this table list the three most dominant phytoplankton species observed in the sample and their relative abundance in the sample. In addition, this table has been enhanced this year to include the overall phytoplankton cell abundance rating of the sample. The overall phytoplankton cell abundance in a sample is calculated using a formula based on the relationship that DES biologists have observed over the years regarding phytoplankton concentrations, algal concentrations, and biological productivity in New Hampshire's lakes and ponds. A mathematical equation is used to classify the overall abundance of phytoplankton cells in a sample into the following categories: *sparse*, *scattered*, *moderate*, *common*, *abundant*, and *very abundant.* Generally, the more phytoplankton cells there are in a sample, the higher the chlorophyll concentration and the higher the biological productivity of the lake.

  NORTH STATION

  The dominant phytoplankton species observed in the **July** sample this year were ***Chrysosphaerella*** **(golden-brown),** ***Mallomonas*** **(golden brown), and** ***Tabellaria*** **(diatom).**

The overall abundance of rating phytoplankton cells in the sample was calculated to be ***very abundant***.

SOUTH STATION

The dominant phytoplankton species observed in the **July** sample this year were ***Asterionella*** **(diatom),** ***Chrysosphaerella*** **(golden-brown),** ***and Uroglenopsis*** **(golden-brown).**

The overall abundance of rating phytoplankton cells in the sample was calculated to be ***abundant.***

Phytoplankton populations undergo a natural succession during the growing season (Please refer to the "Biological Monitoring Parameters" section of this report for a more detailed explanation regarding seasonal plankton succession). Diatoms and golden-brown algae are typical in New Hampshire's less productive lakes and ponds.

- **Table 2: Cyanobacteria**

A **small amount** of the cyanobacterium ***Anabaena*** was observed in the **North** and **South** deep spot plankton samples in **July**. ***This species, if present in large amounts, can be toxic to livestock, wildlife, pets, and humans.*** (Please refer to the "Biological Monitoring Parameters" section of this report for a more detailed explanation regarding cyanobacteria).

Cyanobacteria can reach nuisance levels when phosphorus loading from the watershed to surface waters is increased (this is often caused by rain events) and favorable environmental conditions occur (such as a period of sunny, warm weather).

The presence of cyanobacteria serves as a reminder of the lake's/pond's delicate balance. Watershed residents should continue to act proactively to reduce nutrient loading to the lake/pond by eliminating fertilizer use on lawns, keeping the lake/pond shoreline natural, re-vegetating cleared areas within the watershed, and properly maintaining septic systems and roads.

In addition, residents should also observe the lake/pond in September and October during the time of fall turnover (lake mixing) to document any algal blooms that may occur. Cyanobacteria have the ability to regulate their depth in the water column by producing or releasing gas from vesicles. However, occasionally lake mixing can affect their buoyancy and cause them to rise to the surface and bloom. Wind and currents tend to "pile" cyanobacteria into scums that accumulate in one section of the lake/pond. If a fall bloom occurs, please collect a sample (any clean jar or bottle will be suitable) and contact the VLAP Coordinator.

- **Table 4: pH**

  Table 4 (Appendix B) presents the in-lake and tributary current year and historical pH data.

  pH is measured on a logarithmic scale of 0 (acidic) to 14 (basic). pH is important to the survival and reproduction of fish and other aquatic life. A pH below 6.0 limits the growth and reproduction of fish. A pH between 6.0 and 7.0 is ideal for fish. The mean pH value for the epilimnion (upper layer) in New Hampshire's lakes and ponds is **6.6**, which indicates that the surface waters in the state are slightly acidic. For a more detailed explanation regarding pH, please refer to the "Chemical Monitoring Parameters" section of this report.

  The mean pH at the **North** deep spot ranged from **6.06** in the hypolimnion to **5.99** in the epilimnion, and at the **South** deep ranged from **6.00** in the hypolimnion to **6.11** in the epilimnion, which means that the water is ***slightly acidic.***

  Due to the presence of granite bedrock in the state and acid deposition (from snowmelt, rainfall, and atmospheric particulates) in New Hampshire, there is not much that can be done to effectively increase lake/pond pH.

- **Table 5: Acid Neutralizing Capacity**

  Table 5 (Appendix B) presents the current year and historical epilimnetic ANC for each year the lake/pond has been monitored through VLAP.

  Buffering capacity (ANC) describes the ability of a solution to resist changes in pH by neutralizing the acidic input. The mean ANC value for New Hampshire's lakes and ponds is **6.6 mg/L**, which indicates that many lakes and ponds in the state are at least "moderately vulnerable" to acidic inputs. For a more detailed explanation, please refer to the "Chemical Monitoring Parameters" section of this report.

  The mean Acid Neutralizing Capacity (ANC) of the epilimnion (the upper layer) at the **North** deep spot was **2.4 mg/L** and at the **South** deep spot was **1.6 mg/L,** which is ***less than*** the state mean. In addition, this indicates that the lake/pond is ***moderately vulnerable*** to acidic inputs (such as acid precipitation).

- **Table 6: Conductivity**

  Table 6 (Appendix B) presents the current and historical conductivity values for tributaries and in-lake data. Conductivity is the numerical expression of the ability of water to carry an electric current (which is determined by the number of negatively charged ions from metals, salts, and minerals in the water column). The mean conductivity value for New Hampshire's lakes and ponds is **59.4 uMhos/cm**. For a more detailed explanation, please refer to the "Chemical Monitoring Parameters" section of this report.

  The mean annual conductivity in the epilimnion at the **North** deep spot this season was **32.45 uMhos/cm**, and at the South deep spot was **29.58 uMhos/cm** which is ***much less than*** to the state mean.

  The conductivity in the lake/pond is relatively ***stable*** and ***low.*** Typically conductivity levels greater than 100 uMhos/cm indicate the influence of human activities on surface water quality. These activities include septic system leachate, agricultural runoff, iron deposits, and road runoff (which contains road salt during the spring snow melt). The low conductivity level in the **lake/pond** is an indication of the low amount of pollutants and erosion in the watershed. We hope this trend continues!

- **Table 8: Total Phosphorus**

  Table 8 (Appendix B) presents the current year and historical total phosphorus data for in-lake and tributary stations. Phosphorus is the nutrient that limits the algae's ability to grow and reproduce. Please refer to the "Chemical Monitoring Parameters" section of this report for a more detailed explanation.

  The total phosphorus concentration was ***elevated*** in the **Rice Brook** sample collected on the **June 20** sampling event (**75 ug/L**). The turbidity of this sample was also ***elevated*** (**11.2 NTUs**).

  In addition, the total phosphorus concentration was ***elevated*** in the **Rice Brook Trib** sample collected on the **July 18** sampling event (**55 ug/L**). The turbidity of this sample was also ***elevated*** (**4.66 NTUs**).

  These results suggest that the stream bottom may have been disturbed in these locations while sampling or that erosion is occurring in this portion of the watershed.

  When the stream bottom is disturbed, sediment that typically contains attached phosphorus is released into the water column. When collecting inlet samples, please be sure to sample where the stream is flowing and where the stream is deep enough to collect a "clean" sample.

If you suspect that erosion is occurring in this portion of the watershed, we recommend that your monitoring group conduct a stream survey and storm event sampling along this inlet. This additional sampling may allow us to determine what is causing the ***elevated*** levels of turbidity and phosphorus.

For a detailed explanation on how to conduct rain event sampling and stream surveys, please refer to the 2002 VLAP Annual Report "Special Topic Article" or contact the VLAP Coordinator.

- **Table 9 and Table 10: Dissolved Oxygen and Temperature Data**
  Table 9 (Appendix B) shows the dissolved oxygen/temperature profile(s) for the 2004 sampling season. Table 10 (Appendix B) shows the historical and current year dissolved oxygen concentration in the hypolimnion (lower layer). The presence of dissolved oxygen is vital to fish and amphibians in the water column and also to bottom-dwelling organisms. Please refer to the "Chemical Monitoring Parameters" section of this report for a more detailed explanation.

SOUTH DEEP SPOT
The dissolved oxygen concentration was ***high*** at all depths sampled at the deep spot of the lake/pond. Typically, shallow lakes and ponds that are not deep enough to stratify into more than one or two thermal layers will have relatively high amounts of oxygen at all depths. (The maximum depth at the South station is approximately 3.o meters.) This is due to continual lake mixing and diffusion of oxygen into the bottom waters induced by wind and wave action.

NORTH DEEP SPOT
The dissolved oxygen concentration was ***lower in the hypolimnion (lower layer) than in the epilimnion (upper layer)*** at the deep spot of the lake/pond. As stratified lakes/ponds age, and as the summer progresses, oxygen typically becomes ***depleted*** in the hypolimnion by the process of decomposition. Specifically, the loss of oxygen in the hypolimnion results primarily from the process of biological breakdown of organic matter (i.e.; biological organisms use oxygen to break down organic matter), both in the water column and particularly at the bottom of the lake/pond where the water meets the sediment. When oxygen levels are depleted to less than 1 mg/L in the hypolimnion **(as it was this season and in past seasons),** the phosphorus that is normally bound up in the sediment may be re-released into the water column (a process referred to as ***internal phosphorus loading***).

The ***low*** oxygen level in the hypolimnion is a sign of the lake's/pond's ***aging*** and ***declining*** health. This year the DES biologist conducted the temperature/dissolved oxygen profile in ***August.*** We recommend that the annual biologist visit for the 2005 sampling season be scheduled during ***June*** so that we can determine if oxygen is depleted in the hypolimnion ***earlier*** in the sampling season.

- **Table 11: Turbidity**

  Table 11 (Appendix B) lists the current year and historical data for in-lake and tributary turbidity. Turbidity in the water is caused by suspended matter, such as clay, silt, and algae. Water clarity is strongly influenced by turbidity. Please refer to the "Other Monitoring Parameters" section of this report for a more detailed explanation.

  As discussed previously, the turbidity in the **Rice Brook** sample on the **June** sampling event and the **Rice Brook Trib** sample on the **July** event was ***elevated***, which suggests that the stream bottom may have been disturbed while sampling or that erosion is occurring in this portion of the watershed.

- **Table 12: Bacteria (*E.coli*)**

  Table 12 lists the current year and historical data for bacteria (*E.coli*) testing. (Please note that Table 12 now lists the maximum and minimum results for this season and for all past sampling seasons.) *E. coli* is a normal bacterium found in the large intestine of humans and other warm-blooded animals. *E.coli* is used as an indicator organism because it is easily cultured and its presence in the water, in defined amounts, indicates that sewage **MAY** be present. If sewage is present in the water, potentially harmful disease-causing organisms **MAY** also be present.

  The *E. coli* concentration at the **Boat Landing** was ***elevated*** on the **August 22** sampling event. The concentration of **430** counts per 100 mL ***was greater than*** the state standard of 406 counts per 100 mL for recreational waters that are not designated public beaches. We are happy to report that the concentration was ***much lower*** (50 counts per 100 mL) on the **September** sampling event.

  The *E. coli* concentration at the **Carr Brook Entrance to the lake** station was also ***elevated*** on the **August 22** sampling event. However, the concentration of **230** counts per 100 mL ***was not greater than*** the state standard of 406 counts per 100 mL for recreational waters that are not designated public beaches. Again, we are happy to report that the concentration was ***much lower*** (50 counts per 100 mL) on the **September** sampling event.

  We recommend that your monitoring group conduct rain event sampling and bracket sampling next season in these areas. This additional sampling may help us determine the source of the bacteria.

For a detailed explanation on how to conduct rain event and bracketing sampling, please refer to the 2002 VLAP Annual Report "Special Topic Article" or contact the VLAP Coordinator.

- **Table 13: Chloride**
  The chloride ion (Cl^-) is found naturally in some surfacewaters and groundwaters and in high concentrations in seawater. Research has shown that ***elevated*** chloride levels can be toxic to freshwater aquatic life. In order to protect freshwater aquatic life in New Hampshire, the state has adopted acute and chronic chloride criteria of 860 and 230 mg/L respectively. The chloride content in New Hampshire lakes is naturally low, generally less than 2 mg/L in surface waters located in remote areas away from habitation. Higher values are generally associated with salted highways and, to a lesser extent, with septic inputs. Please refer to the "Chemical Monitoring Parameters" section of this report for a more detailed explanation.

  The **epilimnion** and hypolimnion at both deep spots was sampled for was sampled for chloride in **August** through the DES Lake Survey Program. The results ranged from **3 to 4 ug/L**, which is ***much less than*** the state acute and chronic chloride criteria. This is good news for the lake!

  Although elevated conductivity and chloride levels do not appear to be a problem in Highland Lake, we recommend that your monitoring group read this year's Special Topic Article, "Conductivity is on the rise in New Hampshire's Lakes and Ponds: What is causing the increase and what can be done?" which is found in Appendix D of this report. This article may help your association understand what types of activities can lead to elevated conductivity and chloride levels and what residents can do to minimize this type of pollution.

- **Table 14: Current Year Biological and Chemical Raw Data**
  This table is a new addition to the Annual Report. This table lists the most current sampling season results. Since the maximum, minimum, and annual mean values for each parameter are not shown on this table, this table displays the current year "raw" (meaning unprocessed) data. The results are sorted by station, depth zone (epilimnion, metalimnion, and hypolimnion) and parameter.

- **Table 15: Station Table**
  This table is a new addition to the Annual Report. As of the Spring of 2004, all historical and current year VLAP data is included in the DES Environmental Monitoring Database (EMD). To facilitate the transfer of VLAP data into the EMD, a new station identification system had to be developed. While volunteer monitoring groups can still use the sampling station names that they have used in the past (and are most familiar with), an EMD station name also exists for each VLAP sampling location. For each station sampled at your lake or pond, Table 15 identifies what EMD station name corresponds to the station names you have used in the past and will continue to use in the future.

DATA QUALITY ASSURANCE AND CONTROL

Annual Assessment Audit:

During the annual visit to your lake/pond, the biologist conducted a "Sampling Procedures Assessment Audit" for your monitoring group. Specifically, the biologist observed the performance of your monitoring group while sampling and filled out an assessment audit sheet to document the ability of the volunteer monitors to follow the proper field sampling procedures (as outlined in the VLAP Monitor's Field Manual). This assessment is used to identify any aspects of sample collection in which volunteer monitors fail to follow proper procedures, and also provides an opportunity for the biologist to retrain the volunteer monitors as necessary. This will ultimately ensure that the samples that the volunteer monitors collect are truly representative of actual lake and tributary conditions.

Due to scheduling conflicts, the annual biologist visit was conducted on a day when the VLAP Coordinator was not able to observe the volunteer monitors collect deep spot samples. Please contact the VLAP Coordinator early in 2005 so that a date can be scheduled when the volunteers will be collecting deep spot samples.

Sample Receipt Checklist:

Each time your monitoring group dropped off samples at the laboratory this summer, the laboratory staff completed a sample receipt checklist to assess and document if the volunteer monitors followed proper sampling techniques when collecting the samples. The purpose of the sample receipt checklist is to minimize, and hopefully eliminate, future re-occurrences of improper sampling techniques.

Overall, the sample receipt checklist showed that your monitoring group did a ***very good*** job when collecting samples this season! Specifically, the members of your monitoring group followed the majority of the proper field sampling procedures when collecting and submitting samples to the laboratory. However, the laboratory did identify a few aspects of sample collection that the volunteer monitors could improve upon. They are as follows:

- **Sample labeling:** Please make sure to label your samples with a waterproof pen (a black sharpie permanent marker works best), preferably before sampling. Make sure that the ink does not wash off the bottle when exposed to water. If your association has made its own sample bottle labels, please make sure to fold over one corner of each label before placing it on a sample bottle so that the label will not become permanently attached to the bottle. ***In addition, please make sure that the labels will stick to the bottles when they are wet.***

- **Secchi disk readings:** When measuring the transparency at the deep spot, please remember to take at least two Secchi disk readings in ***meters*** and record these on the field data sheet. Since the depth to which the Secchi disk can be seen in the water can vary depending on how windy or sunny it is, and also on the eyesight of the volunteer monitor, it is best to have at least two people take readings. In addition, please make sure that the readings are taken on the shady, non-windy side of the boat. ***If it is not possible for your group to take transparency readings in meters, please indicate on each field data sheet that the transparency was measured in feet.***

USEFUL RESOURCES

Acid Deposition Impacting New Hampshire's Ecosystems, NHDES Fact Sheet ARD-32, (603) 271-2975 or www.des.state.nh.us/factsheets/ard/ard-32.htm.

Best Management Practices to Control Nonpoint Source Pollution: A Guide for Citizens and Town Officials, NHDES Booklet WD-03-42, (603) 271-2975.

Best Management Practices for Well Drilling Operations, NHDES Fact Sheet WD-WSEB-21-4, (603) 271-2975 or www.des.nh.gov/factsheets/ws/ws-21-4.htm.

Canada Geese Facts and Management Options, NHDES Fact Sheet BB-53, (603) 271-2975 or www.des.state.nh.us/factsheets/bb/bb-53.htm.

Cyanobacteria in New Hampshire Waters Potential Dangers of Blue-Green Algae Blooms, NHDES Fact Sheet WMB-10, (603) 271-2975 or www.des.state.nh.us/factsheets/wmb/wmb-10.htm.

Erosion Control for Construction in the Protected Shoreland Buffer Zone, NHDES Fact Sheet WD-SP-1, (603) 271-2975 or www.des.state.nh.us/factsheets/sp/sp-1.htm.

Freshwater Jellyfish In New Hampshire, NHDES Fact Sheet WD-BB-5, (603) 271-2975 or www.des.state.nh.us/factsheets/bb/bb-51/htm.

Impacts of Development Upon Stormwater Runoff, NHDES Fact Sheet WD-WQE-7, (603) 271-2975 or www.des.state.nh.us/factsheets/wqe/wqe-7.htm.

IPM: An Alternative to Pesticides, NHDES Fact Sheet WD-SP-3, (603) 271-2975 or www.des.state.nh.us/factsheets/sp/sp-3.htm.

Iron Bacteria in Surface Water, NHDES Fact Sheet WD-BB-18, (603) 271-2975 or www.des.state.nh.us/factsheets/bb/bb-18.htm.

Lake Foam, NHDES Fact Sheet WD-BB-4, (603) 271-2975 or www.des.state.nh.us/factsheets/bb/bb-5.htm.

Lake Protection Tips: Some Do's and Don'ts for Maintaining Healthy Lakes, NHDES Fact Sheet WD-BB-9, (603) 271-2975 or www.des.state.nh.us/factsheets/bb/bb-9.htm.

Proper Lawn Care In the Protected Shoreland, The Comprehensive Shoreland Protection Act, NHDES Fact Sheet WD-SP-2, (603) 271-2975 or www.des.state.nh.us/factsheets/sp/sp-2.htm.

Road Salt and Water Quality, NHDES Fact Sheet WD-WMB-4, (603) 271-2975 or www.des.state.nh.us/factsheets/wmb/wmb-4.htm.

Sand Dumping - Beach Construction, NHDES Fact Sheet WD-BB-15, (603) 271-2975 or www.des.state.nh.us/factsheets/bb/bb-15.htm.

Shorelands Under the Jurisdiction of the Comprehensive Shoreland Protection Act, NHDES Fact Sheet SP-4, (603) 271-2975 or www.des.state.nh.us/factsheets/sp/sp-4.htm.

Soil Erosion and Sediment Control on Construction Sites, NHDES Fact Sheet WQE-6, (603) 271-2975 or www.des.state.nh.us/factsheets/wqe/wqe-6.htm.

Swimmers Itch, NHDES Fact Sheet WD-BB-2, (603) 271-2975 or www.des.state.nh.us/factsheets/bb/bb-2.htm.